Name _____ Class _____ Date _____

2-1 Practice

Patterns and Inductive Reasoning

1. Find a pattern for each sequence. Use the pattern to show the next two terms.

a. 5, 11, 18, 26, …

b. A, B, D, E, G, H, …

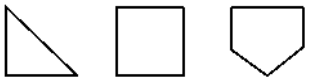
c. –3, 6, –12, 24, –48, …

d. 1, 5, 30, 210, 1680, …

5.

2. Use sequence A and inductive reasoning to make a conjecture.

Sequence A:



a. How many sides does the fifth figure of Sequence A have?

b. How many sides does the tenth figure of Sequence A have?

c. How many sides does the fourteenth figure of Sequence A have?

3. Use sequence B and inductive reasoning to make a conjecture.

Sequence B: –5, 4, –2, –5, 4, –2, –5, 4, –2, …

a. What is the tenth term of Sequence B?

b. What is the fifteenth term of Sequence B?

4. Make a conjecture for each scenario. Show your work, as in the first example.

a. the sum of the first 100 even numbers.

To start, find the first few terms of the sequence and look for a pattern.

$2 = 2$	$= 1 \times 2$
$2 + 4 = 6$	$= 2 \times \square$
$2 + 4 + \square = \square$	$= 3 \times \square$
$2 + 4 + 6 + \square = \square$	$= \square \times \square$
Pattern	$= \square \times \square$

b. the square of an odd number

c. the cube of a negative number

d. the product of two even numbers and an odd number

e. the product of a multiple of 5 and a multiple of 2

5. Find a pattern for each sequence. Use inductive reasoning to show the next two terms.

a. 3, 5, 9, 17, …

b. 5, 3, 9, 7, 21, …

c. 0.3, –0.09, 0.0027, …

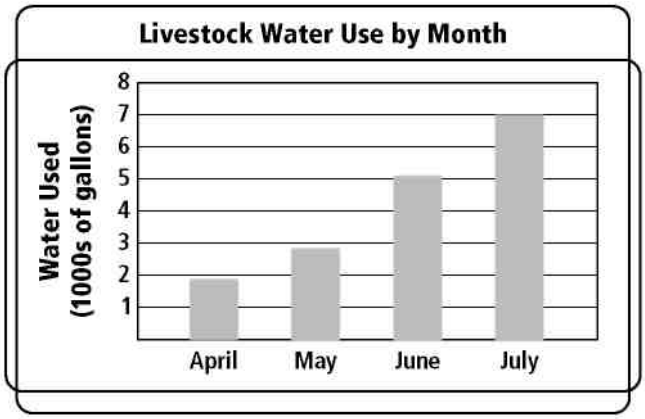
d. $\frac{2}{3}, \frac{4}{9}, \frac{8}{27}, \ldots$

e. 2, 3, 5, 8, 13, 21, …

f. 4, 7, 12, 19, 28, …

6. Use inductive reasoning to make a prediction for each scenario.

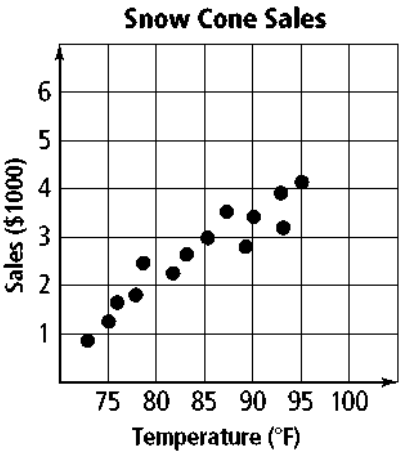
A farmer keeps track of the water his livestock uses each month.



a. Predict the amount of water used in August.

b. Is it reasonable to use the graph to predict water consumption for October? Explain.

Hannah sells snow cones during soccer tournaments. She records data for snow cone sales and temperature.



a. Predict the amount of snow cone sales when the temperature is 100°F.

b. Is it reasonable to use the graph to predict sales for when the temperature is 15ºF? Explain.

7. Find one counterexample to show that each conjecture is false.

a. The sum of two integers is always positive.

a. The product of two mixed numbers is never a whole number.

c. All four-sided figures are rectangles.

8. Draw the next two figures in the sequence shown below.

29. Use letters of the alphabet and create two different sequences that begin with the same two letters.